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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

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UNITED STATES DEPARTMENT OF AGRICULTURE

1950 SUMMARY OF RESULTS OF FUNGICIDE TESTS ON CROPS OTHER THAN FRUIT TREES

Supplement 210

March 15, 1952



The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

PLANT DISEASE REPORTER SUPPLEMENT

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station

Beltsville, Maryland

+ 1950 SUMMARY OF RESULTS OF FUNGICIDE TESTS
ON CROPS OTHER THAN FRUIT TREES x

Compiled by

The Fungicide Committee of the American Phytopathological Society:
Sub-Committee on Testing and Results of Newer Fungicides¹

Plant Disease Reporter
Supplement 210

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1950 SUMMARY OF RESULTS OF FUNGICIDE TESTS
ON CROPS OTHER THAN FRUIT TREES

The summary of fungicide tests for 1950 has been long delayed because of publication difficulties, but, thanks to the cooperation of Dr. P. R. Miller and the Plant Disease Survey, it is now possible to release much of the information which has been accumulated. Unfortunately, the fruit tree data are not in final form and will have to be presented separately or combined with the 1951 report.

The information herein contained is based on reports submitted by many contributors throughout the country, most of whom are mentioned in connection with the particular report concerned. The committee is grateful to all of those who have contributed.

Nearly all materials used in the 1950 tests were also used in 1949 tests, and are listed, together with the manufacturers, in the 1949 report (Plant Disease Reporter Supplement 192, 1950.)

FUNGICIDE EVALUATION STUDIES - 1950

VEGETABLE CROPS

BEANS

FUSARIUM and RHIZOCTONIA -- Pinto UI#111
Soil treatment with seed at planting; Small plots. Colorado -- W. D. Thomas, Jr., W. J. Henderson, and W. E. Stratton.

Order of Disease Control: (1) Dithane Z-78 at 4 lbs./acre, (2) Ceresan M at 1 lb./acre, (3) Dow 9B at 4 lbs./acre, (4) Crag #531 at 3 lbs./acre, (5) Phygon XL at 2 lbs./acre, (6) Orthocide 406 at 4 lbs./acre, (7) Arasan at 3 lbs./acre.

Plant Safety: Dithane Z-78, Orthocide, Crag, Arasan, Phygon, Ceresan M, Dow 9B.

Yields: Dithane Z-78, Orthocide, Phygon XL, Ceresan M, Arasan, Crag, Dow 9B.

Overall Preference: Dithane Z-78, Orthocide, Crag, Ceresan M, Phygon XL, Arasan, Dow 9B. Need more dosage studies with Dow 9B.

DAMPING-OFF -- Round Pod, Kidney Wax
Seed treatment: Field plots. Michigan -- D. J. DeZeeuw and A. L. Anderson.

Order of Disease Control: Phygon XL, Arasan, Panogen, Ceresan M, Carbide & Carbon L-224, C & C L-640, C & C 5400, Dithane Z-78, Bioquin 1, Panogen S, Check.

Overall Preference: (1) Arasan, Ceresan M, Phygon XL, and Panogen; (2) three C & C company numbers.

SNAP BEAN

Phytotoxicity test: Ohio -- J. D. Wilson.

Tribasic copper gave somewhat larger yield than Zerlate in one field experiment of 4 applications of spray.

In another on control of bacterial blight, only Methasan S and F1189, out of 11 compared,

gave better yields than check.

Others in order were: Dithane D-14 + ZnSO₄, MnEBD + Triton, Robertson Cu, Orthocide 406, Zac x 6, COCS, Vancide 51, Tribasic, Parzate, Zerlate, Zac x 6 + p.e.p.s. Blight not very severe, so fungicides probably injured host.

CABBAGE

DOWNY MILDEW

Field plots: Hand duster, 6 applications 5 days apart, mildew present at start. South Carolina -- W. M. Epps.

Order of Disease Control: (1) Spergon 4.8% active at 18 lbs. per acre/application, (2) Phygon 1. % active, at same rate, (3) Dithane Z-78, 3.9% active at same rate, (4) Check.

Overall Preference: (1) Spergon, (2) Phygon and Dithane.

CARROTS

LEAF SPOTS AND VIRUS YELLOWS

Field plots: Eight sprays July 5-September 13. Ohio -- J. D. Wilson.

Some Cercospora and a little Macrosporium (Alternaria) appeared late. All 11 fungicides gave better yields than check, but only Dithane + ZnSO₄ at 4-1-100 was significantly better. In order others were Bordeaux 6-6-100; COCS + DDT, 5-day 4-2-100; Methasan W 1 1/2-100; COCS + Parathion 1; Zerlate 2-100; Parzate 2-100; COCS + DDT, 10-day; Robertson Cu 2.2-100; Tribasic 4-100; F-1124, 5-100; Zac 6-100; Orthocide 406, 2-100. A 5-day interval better than 10-day for yellows control by DDT. Foliage condition best with Parzate. Dithane and Robertson Cu

caused bronzing. Orthocide and F1124 also slightly injurious. More yellows in copper treatments than in organics.

CELERY

EARLY AND LATE BLIGHTS

Field plots: Power sprayer, 10-day applications, July 20-September 19. Ontario, Canada -- L. K. Richardson. Blights abundant at start.

Order of Control and Percentage of Blight:

(1) Karbam at 2-100, 10%; (2) Bordeaux 10-10-50, 12.5%; (3) Robertson Cu 15%; (4) Phygon 1-100, 17.5%; (5) Basicop 5-100, 20%; (6) Tricop 5-100, 25% (7) Dithane Z-78, 2 qts.-100, 30%; (8) Crag 341 SC, 1 qt.-100, 85%; (9) Crag 341 C, 1 qt.-100, 95%; (10) Check, 100%.

CERCOSPORA LEAF SPOT

Field plots: 10 sprays between July 5-August 28. Ohio -- J. D. Wilson.

Little disease, came in late. Two best were Tribasic 4-100, and Methasan W at 1 1/2-100, while lowest increases over check were secured with Orthocide 406 at 2-100 and Fung. 1124 at 5-100. Others included Methasan B, MnEBD, COCS, Parzate, Robertson Cu, and Fungicide A in that order.

ONIONS

SMUT

Seed treatments, pelleting and sticker: Small field plots. Illinois -- M. B. Linn.

Order of Control: (1) Thiram at 1 lb. to 1 of seed, (2) Same at 3/4 lb., (3) Same at 1/2 lb.; (4) Arasan SF at 1 lb.; (5) Arasan at 1 lb.; (6) Tersan at 1 lb.; (7) Arasan SF at 3/4 lb.

Order of Preference: (1) Thiram at 1/2 lb., (2) Same at 3/4 lb.; (3) Arasan SF at 3/4 lb.; (4) Tersan at 1 lb.; (5) Arasan SF at 1 lb.; (6) Arasan at 1 lb.

DOWNY MILDEW AND THRIPS

Field plots: 5 sprays July 7-August 16. Ohio -- J. D. Wilson.

Dithane Z-78 plus 10 different insecticides, and Parzate + DDT all gave conspicuously better control and yields than check. Others giving significantly better yields in order were Methasan W + DDT, Orthocide 406 + DDT, and 1124 + DDT. Others not quite significant included DDT alone, Zerlate + DDT, Bordeaux + DDT, Zac x 6 + DDT, Tribasic + DDT, 1189 + DDT, and COCS + DDT. Parathion better than Dilan, Aldrin, BPR, DDT, Chlordane, EPN, C4049, and Toxaphene in that order of yields. The last two significantly less than Parathion. Coppers caused burning.

DOWNY MILDEW

Field plots: Hand sprayers, 11 applications March 3-May 13. California -- C. E. Yarwood and Morris Cohen.

Order of Control: (1) Rosin lime sulfur 2%, (2) Dithane Z-78 at .2%, (3) Check. Overall preference in same order.

DOWNY MILDEW AND BLAST

Field plots: Power-sprayed, 9 weekly applications June 28-August 30. New York -- A. G. Newhall.

Order of Control: (1) Dithane D-14 + ZnSO₄ and Parzate + ZnSO₄; (2) Manganese ethylene bis dithiocarbamate; (3) Check. Two replicates.

BLAST AND DOWNY MILDEW

Power-sprayed vs. Dusted: 5 applications Dithane D-14 + ZnSO₄, vs. Dithane Z-78 7% dust. New York -- A. G. Newhall. Best control and yields from sprays, on three farms receiving 5, 6, and 12 applications respectively, four replications.

BLAST

Field plots: Power-dusted, 6 weekly evening applications. New York -- A. G. Newhall.

Order of Control: Dithane Z-78 7% + sulfur 30% vs. same without sulfur. No significant difference, six replications.

PINK ROOT AND FUSARIUM

Soil treatment: Small plots, Colorado -- W. D. Thomas, Jr., R. L. Skiles, and C. T. Lange.

Order of Disease Control: (1) Dowfume N at 25 gals./acre; (2) Dithane Z-78 at 4 lbs./acre; (3) Shell OS-840 at 30 gals./acre; (4) Ceresan M at 1 1/2 lbs./acre; (5) Phygon 4 lbs./acre; (6) Arasan, 2 lbs./acre.

Plant Safety: (1) Dowfume N, Dithane Z-78, and Shell OS-840, (2) Arasan, (3) Phygon, (4) Ceresan.

Yields: (1) Dithane, (2) Dowfume N, (3) OS-840, (4) Arasan, (5) Phygon, (6) Ceresan M.

Overall Preference: Same order as disease control.

PURPLE BLOTCH

Sprayed: 7 applications 10 days apart, 120 gals. p.a. Colorado -- W. D. Thomas, R. L. Skiles, and C. T. Lange.

Order of Disease Control: (1) Yellow Cuprocid 1 1/2 lbs./acre, (2) Dithane Z-78 1 1/2 lbs., (3) Parzate 1 1/2 lbs.

Yield: (1) Dithane, (2) Parzate, (3) Yellow Cuprocid.

Overall Preference: (1) Yellow Cuprocid, (2) Dithane and Parzate equal.

PEAS

DAMPING-OFF

Seed treatments: Field plots. Michigan -- D. J. DeZeeuw and A. L. Anderson.

Order of Disease Control: (1) Phygon XL at .25% wgt., (2) Panogen at .2% wgt., (3) Ceresan M at .125% wgt., (4) Carbide & Carbon L-224 at .125% wgt., (5) C. & C. L-640 at .125% wgt., (6) Yellow Cuprocide at .25% wgt., (7) Bioquin 1 at .125% wgt., (8) Arasan at .125% wgt., (9) C. & C. 5400 at .125% wgt., (10) Panogen S at .2% wgt., (11) Spergon at .25% wgt., (12) Check.

Order of Overall Preference: (1) Panogen, Ceresan M, Phygon XL, (2) Arasan, Yellow Cuprocide, Bioquin 1, C. & C. L-224, and L-640.

SEED DECAY AND DAMPING-OFF

Seed treatments -- Dust, slurry: Greenhouse 50°, cold room 50°, and field. Wisconsin -- D. J. Hagedorn.

Order of Disease Control: A. Field (1) KF467 (mercurial) at 1 oz./bu., (2) Phygon at .5 oz./bu., (3) Arasan at 1.2 oz./bu., (4) Spergon at 2 oz./bu., (5) Phygon XL slurry at .5 oz./bu., (6) Arasan SF slurry at .8 oz./bu., (7) Dow 9B at 1.8 oz./bu., (8) Check. B. Greenhouse (1) KF467, (2) Phygon, (3) Spergon, (4) Arasan, (5) Arasan SF, (6) Phygon XL, (7) Check, (8) Dow 9B.

Overall Preference: Same as under A. Field except reverse 3 and 4.

CORN

SEED DECAY AND SEEDLING DISEASE

Seed treatments: Madison, Wisconsin -- Paul E. Hoppe.

Order of Disease Control: Vancide 51, seeds moistened with concentrated solution, gave perfect control where checks showed 100% seed decay. Carbon and Carbide 224, C. & C. 640, Arasan, and Phygon also gave good control and are listed in order of preference. Spergon gave inferior control.

POTATOES

EARLY BLIGHT

Cobbler variety, on muckland at Willard, Ohio -- J. D. Wilson ("Most severe attack ever seen".)

Of 15 fungicides applied 6 times between July 9 and August 31, 5 were significantly better than all others. These were Dithane D-14 + ZnSO₄ + DDT (4-1-1-100), Dithane Z-78 + DDT (2-1-100), Methasan S + DDT (3-1-100), Methasan B + DDT (3-1-100), and Tribasic + parathion (4-1-100). Of 5

insecticides employed with Tribasic, parathion was outstanding and Dilan very good.

EARLY AND LATE BLIGHT

Cobblers, upland at Marietta, Ohio -- 5 applications May 23 to July 6 -- J. D. Wilson.

Of 15 fungicides used with DDT, Dithane D-14 was outstanding. Tribasic + p.e.p.s., Dithane Z-78, and Fungicide 1189 were all better than 12 others. Cop-O-Zink significantly better than four other treatments. Dilan gave slightly better yields than EPN, parathion, DDT, or Aldrin for the insecticides.

Rank of all fungicides from three experiments like above on yield basis was as follows: Dithane Z-78, Dithane D-14, Dithane Z-78 + p.e.p.s., Tribasic + p.e.p.s., Methasan S, copper cupferron, Methasan B, Zerlate, Fungicide 1189, Crag 658, Cop-O-Zink, COCS, Zac x 6 + p.e.p.s., Robertson Cu, CP2271, Tribasic, and Zac x 6. The ranking of insecticides, all used with Tribasic, was Dilan, parathion, EPN, DDT, Aldrin, and DDT + Aldrin, in this order.

Performance of Tribasic and Zac x 6 was increased by p.e.p.s., but Dithane Z-78 was decreased.

EARLY AND LATE BLIGHTS

Variety Katahdin, on upland at Wooster, Ohio. Sprayed 7 times July 10 to September 5 -- J. D. Wilson. (40 fungicides and formula-tions).

Ranked on Yield Basis: Dithane D-14 significantly better than all but Cop-O-Zink, Methasan S, Parzate dry, and MnEBD. Again MnEBD, and Cop-O-Zink were better than all but the above 4 and COCS + p.e.p.s. Crag 658 was better than 26 others. Bordeaux better than only 10 others.

EARLY BLIGHT

Variety Cobbler (?): Upland, Wooster, Ohio. Sprayed 5 times June 22 to July 28 -- J. D. Wilson.

In a comparison between 5 formulations of Zac, 6 of Methasan, 4 of Parzate, 3 of Robertsons Copper and 2 of Vancide, all treatments gave yields significantly better than the check, owing probably to DDT used in all. Parzate was above average in disease control and yield. Addition of p.e.p.s. to Vancide 51 improved its performance.

EARLY BLIGHT

Variety Cobbler: Upland, Wooster, Ohio. J. D. Wilson. An experiment to compare 7 fungicides at high gallonage (160 g.p.a.) and

low (1X) concentration, vs. low gallonage (40 g.p.a.) and high (4X) concentration, all with DDT. Results gave very little advantage to the low gallonage concentration, yields from which exceeded the regular in five out of seven instances, but not significantly.

Materials Ranked on Yields: (1)

Methasan W, Zerlate, (2) Parzate, Zac, Dithane, (3) Tribasic, COCS.

LATE BLIGHT

Minnesota (Crookston; H. D. Thurston and D. S. Olmsted. Variety Pontiac).

Six applications, 7 to 10-day intervals. Disease negligible. Listed in order of yield, but not statistical differences:

Tribasic spray, Cop-O-Zink spray, Mackoblend ZM spray, Cop-O-Zink dust, Z-78 spray, Tribasic dust, Z-78 dust, Mackoblend ZM dust. All sprays were at 100-130 gals./acre; all dusts at 20-40 lbs./acre.

Ohio (Wooster; J. D. Wilson. Variety Cobbler, on upland).

Several fungicides all at 4X concentration applied at 80 and 40 g.p.a. Parzate liquid, and COCS gave best yields but a copper aerosol at only 6 gallons per acre and providing only half as much copper showed up well.

Ranked on Yields: Parzate + ZnSO₄ (8-4-100), COCS (16-100), Dithane Z-78 + C 4049 (8-4-100), Copper aerosol, Robertson Cu (8.8-100), Dithane Z-78 + Dilan (8-4-100), Methasan S (12-100), Vancide 51 (12-100), Zac S (12-100). All above had 8 lbs. DDT except where Dilan or C 4049 were employed.

Prince Edward Island (Charlottetown; L. C. Callbeck. Variety Green Mountain).

Eight sprays, July 13 to September 16.

In two experiments, Bordeaux (8-4-100) gave best control of both foliage infection and subsequent tuber rot. In one of these experiments Dithane D-14 + zinc sulfate (2 qts. -1-100) gave highest yield but tuber rot was 12.9%, as compared with 1.3% for bordeaux and 18.1% for the check. In the other experiment Z-78 gave highest yield but 12.5% tuber rot compared to 1.1% for bordeaux and 13.3% for check. Over-all preference in Experiment I: Bordeaux (8-4-100), Basicop (3.5-100), Crag 658 (1.5-100), D-14 + zinc sulfate (2 qts. -1-100), Phygon XL (1-100); in Experiment II: Bordeaux (8-4-100), Fungicide 1124 and Fungicide 1189; SR 406, and Z-78.

Tennessee (Crossville; W. W. Stanley, E. L. Felix, and T. R. Gilmore. Early and late blights and insects on Cobbler).

Six applications, 10-day intervals, 500-600 g./acre.

COCS + 50% DDT (4-2-100), and Tribasic + 25% Aldrin (4-1-100) given over-all preference. Tribasic + DDT (4-2-100) without adhesive, Tribasic + 50% Dilan (4-1-100), Bordeaux + DDT (8-4-2-100), and Tribasic + DDT (4-2-100) were close behind, with Bordeaux + DDT (8-4-1-100) and DDT alone (2-100) following. Copper naphthenate emulsion (3.8% Cu) + DDT (2 gals.-2-100) without adhesive was injurious. Except where indicated otherwise all sprays contained synthetic resin adhesive (National #3605) at 1 pint/100 gals.

TOMATO

ANTHRACNOSE

Illinois (Urbana; hydraulic sprays; 10-day interval applications; variety Ill. 97A)

Control: (1) Mn bis; (2) Zerlate-Tribasic; (3) Dithane D-14 & ZnSO₄; (4) Z-78; (5) Zerlate; (6) Tribasic; (7) Cop-O-Zink. All materials equally safe.

Yield: (1) Mn bis; (2) Dithane D-14 & ZnSO₄; (3) Zerlate-Tribasic; (4) Z-78; (5) Tribasic; (6) Cop-O-Zink; (7) Zerlate.

Overall Preference: (1) Mn bis; (2) Dithane D-14 & ZnSO₄; (3) Z-78; (4) Zerlate-Tribasic.

New Jersey (New Brunswick; hydraulic sprays; 5 applications; variety Rutgers)

Control: (1) M-294, Zerlate, Zerlate-Tribasic, Orthocide 406, Dithane D-14 & ZnSO₄, Zerlate + Tribasic, Zerlate + Z-78, Parzate; (2) Z-78-Tribasic, Z-78-bordo, Z-78; (3) Phygon XL, Tribasic, Cop-O-Zink, Crag 658.

All materials equally safe. No significant differences in yield.

Overall Preference: (1) Zerlate; (2) Zerlate-Tribasic, Orthocide 406, Dithane D-14 & ZnSO₄, Zerlate + Tribasic, Zerlate + Z-78, Parzate; (3) Z-78-Tribasic, Z-78-bordo, Z-78; (4) Phygon XL, Tribasic, Cop-O-Zink, Crag 658.

Note: M-294 is Cupric N-nitrosophenyl-hydroxylamine.

New Jersey (Riverton; hydraulic sprays; 5 applications; variety Improved Garden State)

Control: (1) Zerlate + Tribasic, Z-Z-Z-T-T; (2) Zerlate + Tribasic, Z-T-Z-T-Z, Zerlate + Dithane D-14 & ZnSO₄; (3) Zerlate + Crag 658, Z-Z-T-Z-T, M-294; (4) Dithane, Orthocide 406*, Orthocide 406**, Zerlate-Tribasic concentrate, Mn bis; (5) Tribasic, Crag 658.

No data available on plant safety. Yield differences not significant. No over-all

preference given.

(*Orthocide 406 at 2 lbs. per 100 gallons;
**Orthocide 406 at 4 lbs. per 100 gallons.)

New York (Geneva; hydraulic sprays; 5 applications; variety Gem)

Control: (1) Orthocide 406**; (2) Orthocide 406*, Zerlate + bordo, Z-Z-B-Z-B; (3) C & C 5400, Zerlate, Zerlate + Tribasic; (4) Zac, check.

All materials equally safe except Zerlate + bordo which showed some injury.

Yield: (1) Z-Z-B-Z-B, Orthocide 406*, Zerlate + Tribasic, Orthocide 406**, Zerlate; (2) Zac, C & C 5400, Zerlate + bordo.

Overall Preference: (1) Z-Z-B-Z-B.

(*Orthocide 406 at 2 lbs. per 100 gallons;
**same material at 4 lbs. per 100 gallons.)

EARLY BLIGHT

Alabama (Clanton; dusts and spray, hand equipment; seven weekly applications; variety Rutgers)

Control: (1) Z-78 (5% dust); Z-78 (7% dust); Tribasic copper (7% dust); liquid Parzate. (3) Phygon XL (2% dust).

Plant Safety: (1) Z-78 (5% dust); liquid Parzate. (2) Z-78 (7% dust); Tribasic copper; Phygon XL.

Yield: (1) Z-78 (5% dust); (2) Z-78 (7% dust); (3) Tribasic copper; (4) Phygon XL; (5) liquid Parzate.

Overall Preference: (1) Z-78 (5% dust); (2) Z-78 (7% dust); Tribasic copper.

California (Riverside; hydraulic sprays-400 lbs. pressure; six applications; variety Pearson)

Control: (1) Phygon; (2) Zineb; (3) Crag 658; (4) cuprous oxide plus sulfur.

All materials equally safe. Yield differences not significant.

Overall Preference: (1) Phygon; (2) Zineb.

Connecticut (Mt. Carmel; hydraulic sprays; 9 applications; variety Chatham)

Control: (1) Phygon XL; (2) Z-78, Orthocide 406.

All materials equally safe. No yield data.

Overall Preference: (1) Phygon XL; (2) Z-78, Orthocide 406.

Georgia (Tifton; hydraulic sprays and power dusts; tomato transplants; 7-day interval applications)

Control: (1) Nabam & ZnSO₄, Zerlate; (2) Z-78, Tribasic copper; (3) Copper Cpd A; (4) Parzate; (5) Phygon XL and dusts of Zerlate, Z-78, Tribasic copper, and Phygon

XL.

Apparently all materials equally safe. No yield data.

Overall Preference: (1) Nabam & ZnSO₄, Zerlate; (2) Z-78, Tribasic copper.

Hawaii (Poamoho; hydraulic sprays; 8 applications; variety Lanai)

Control: (1) Mn bis; (2) Parzate; (3) Tribasic; (4) Yellow Cuprocide; (5) Zerlate. All materials equally safe.

Yield: (1) Tribasic; (2) Mn bis, Yellow Cuprocide; (3) Zerlate; (4) Parzate.

No preference indicated; Mn bis outstanding in control of early blight on both fruit and foliage.

Illinois (Urbana; hydraulic sprays; 10-day interval applications; variety Ill. 97A)

Control: (1) Z-78; (2) Dithane D-14 & ZnSO₄; (3) Zerlate-Tribasic; (4) Mn bis; (5) Tribasic copper; (6) Cop-O-Zink; (7) Zerlate. All materials equally safe.

Yield: (1) Mn bis; (2) Dithane D-14 & ZnSO₄; (3) Zerlate-Tribasic; (4) Z-78; (5) Tribasic copper; (6) Cop-O-Zink; (7) Zerlate.

Overall Preference: (1) Mn bis; (2) Dithane D-14 & ZnSO₄; (3) Z-78; (4) Zerlate-Tribasic.

Illinois (Mt. Prospect; hydraulic sprays; 5 applications; variety Garden State)

Control: (1) Mn bis, Z-78, Tribasic copper, Orthocide 406, Zerlate + Tribasic, Zerlate-Tribasic, Zerlate, Z-78 + Tribasic; (2) Crag 658 + Zerlate; (4) Crag 658.

No indication of any phytotoxicity. Yield differences not significant. No preferences indicated.

Mississippi (Crystal Springs; knapsack dusts; staked greenwraps; 5 applications; variety Rutgers)

Control: (1) Copper Cpd A, Zineb; (2) Tribasic copper.

All materials equally safe. Yield differences not significant. No preferences indicated.

Mississippi (Crystal Springs; knapsack dusts; unstaked greenwraps; 5 applications; variety Rutgers)

Control: (1) Tribasic copper; (2) Copper Cpd A; (3) Zineb. All materials equally safe.

Yield: (1) Tribasic copper; (2) Copper Cpd A; (3) Zineb.

Overall Preference: (1) Tribasic copper; (2) Copper Cpd A; (3) Zineb.

New York (Geneva; hydraulic sprays; 5 applications; variety Gem)

Control: (defoliation) (1) Z-Z-B-Z-B, Zerlate + bordo, Orthocide 406**, Zerlate + Tribasic; (2) Orthocide 406*, Zerlate; (3) C &

C 5400, Zac, check.

Control: (fruit rot) (1) Orthocide 406**;
(2) Orthocide 406*, Zerlate + Tribasic, C &
C 5400, Zerlate, Z-Z-B-Z-B, Zerlate +
bordo, Zac.

Plant Safety: All materials equally safe;
combination of Zerlate + bordo showed some
injury.

Yield: (1) Z-Z-B-Z-B, Orthocide 406*,
Orthocide 406**, Zerlate + Tribasic, Zerlate;
(2) Zac, C & C 5400, Zerlate + bordo.

Overall Preference: (1) Z-Z-B-Z-B.
Orthocide shows considerable promise.
Others not preferred for control of all tomato
diseases.

(*Material at 2 lbs. per 100 gallons;

**material at 4 lbs. per 100 gallons.)

LATE BLIGHT

Alabama (Etowah County; hydraulic sprays;
8 applications; variety Rutgers)

Control: (1) Dithane D-14 & ZnSO₄, Z-
78, liquid Parzate & ZnSO₄, Parzate, Tri-
basic copper, Copper Cpd A; (3) Phygon XL.

Plant Safety: (1) Dithanes, Parzates,
Phygon; (2) Tribasic copper, Copper Cpd A.

Yield: (1) Dithane D-14; (2) Z-78; (3)
Phygon XL; (4) Parzates, Tribasic copper,
Copper Cpd A.

Overall Preference: (1) Dithane D-14;
(2) Z-78; (3) liquid Parzate; (4) Tribasic
copper, Copper Cpd A; (5) Parzate; (6)
Phygon.

Florida (Homestead; hydraulic sprays; 20
applications at 3-7 day intervals; variety Mo.
S34)

Control: (1) Z-78, Parzate, Phygon XL,
Phygon XL-Dithane D-14 & ZnSO₄ & lime,
liquid Parzate & ZnSO₄, Dithane D-14 & ZnSO₄
& lime, Dithane D-14 & ZnSO₄; (2) Orthocide
406; (3) Tribasic copper, copper thiram, P
111-5.

Plant Safety: (1) Z-78, Parzate, Phygon
XL, Phygon XL-Dithane D-14 & ZnSO₄ &
lime, Orthocide 406, Tribasic copper, copper
thiram; (2) liquid Parzate & ZnSO₄, Dithane
D-14 & ZnSO₄ & lime, Dithane D-14 & ZnSO₄;
(3) P 111-5.

Yield: (1) Z-78; (2) Parzate, Phygon XL,
Phygon-Dithane D-14 & ZnSO₄ & lime; (3)
liquid Parzate & ZnSO₄, Dithane D-14 &
ZnSO₄ & lime, Dithane & ZnSO₄; (4) Ortho-
cide 406; (5) Tribasic copper; (6) copper
thiram; (7) P 111-5.

Overall Preference: (1) Z-78; (2) Parzate,
Phygon XL, Phygon XL-Dithane D-14 &
ZnSO₄ & lime; (3) liquid Parzate & ZnSO₄,
Dithane D-14 & ZnSO₄ & lime, Dithane D-14
& ZnSO₄; (4) Orthocide 406.

Note: Nabam treatments resulted in

leaf roll, marginal chlorosis, stunting, and
fruit injury; P 111-5 caused rather severe
chlorosis and stunting. Tribasic copper sul-
fate, copper thiram, P 111-5 did not provide
sufficient control of late blight to justify further
testing.

Maryland (Salisbury; hydraulic sprays; 7 appli-
cations at 11-day intervals; variety Rutgers)

Control: (1) Orthocide 406; (2) Z-78; (3)
C & H copper, Z-Z-T-T-T-T-T; (4) Z-Z-Z-Z-
T-T-T; (5) Z-Z-D-D-T-T-T.

Apparently all materials equally safe.

Yield: (1) C & H copper; (2) Orthocide 406;
(3) Z-78; (4) Z-Z-T-T-T-T-T; (5) Z-Z-D-D-T-
T-T; (6) Z-Z-Z-Z-T-T-T; (7) Cop-O-Zink.

Overall Preference: (1) Z-Z-T-T-T-T-T;
(2) Z-78; (3) Orthocide 406, Z-Z-D-D-T-T-T;
(4) C & H copper, Z-Z-Z-Z-T-T-T; (5) Cop-
O-Zink.

Mississippi (Crystal Springs. See summary
under Early Blight for both staked and unstaked
tomatoes.)

Missouri (Columbia; hydraulic sprays; 10-day
interval applications; variety Rutgers)

Control: (1) Fixed copper, Z-78; (4)
Zerlate.

Plant Safety: (1) Z-78, Zerlate.

Yield: (1) Fixed copper, Z-78.

Overall Preference: (1) Fixed copper, Z-
78. Zerlate not effective against late blight, but
very effective against Septoria blight and
anthracnose. Present recommendations are
alternate fixed copper and Zerlate. If only one
fungicide were used, Z-78 would be preferred.

North Carolina (Hendersonville; hand dusters;
4 to 7-day interval applications; variety
Marglobe)

Control: (1) Tribasic copper; (2) C & H
copper; (3) Z-78.

All materials equally safe.

Yield: (1) Tribasic copper; (2) C & H
copper; (3) Z-78.

Overall Preference: (1) Tribasic copper.

Note: This is the third year that coppers
have proved better than zineb at this location
where late blight has been very severe each
year.

Nova Scotia (Kentville; wheelbarrow sprayer; 3
applications; variety Stokesdale)

Control: (1) Tricop, COCS, Tribasic
copper; (2) Copper Cpd A; (3) Perenox; (4)
Zerlate-bordo.

All materials equally safe except Zerlate-
bordo.

Yield: (1) Perenox, Tricop, Copper Cpd A
Tribasic copper, COCS; (2) Zerlate-bordo.

Overall Preference: (1) Tricop, Tribasic copper, COCS. Satisfactory control of late blight was obtained with fixed coppers. Zerlate, followed by bordo and then Zerlate, did not hold the disease, 7.5% as against 28.3% in the check. The split program of Zerlate-bordo is recommended to growers with the change to bordo taking place when late blight appears.

Ohio (Wooster, J. D. Wilson. Late blight severe. Seven applications of 39 formulations at 160 gal. per acre at 300 p.s.i. between July 12-September 12 at 10-day intervals, except reduced to 7 days between 3rd, 4th, and 5th applications.)

Results: Twelve of the best 15 treatments contained copper in some form. COCS + p.e.p.s. 4-1/2-100 gave best control of all. Other high ranking were Bordeaux 8-6-100, Robertson Cu 2.2-100, Phelps Dodge Paste 4-100, and Tribasic 4-100. Second in effectiveness were the organics Dithane + ZnSO_4 4-1-100, Parzate 2-100, MnEBD 1.7-100. Close after these came Orthocide 2-100, and Methasan slurry 3-100. Near the bottom of the list came Zerlate, Zac, and the Vancides.

Slurries were better than their dry-mix counterparts.

Zerlate + Tribasic tank mix 1-2-100 was better than alternating with each at full strength (2-100, and 4-100 respectively).

The 10-day intervals probably account for relatively poorer showing of organics against the coppers.

Ohio: Late Blight Fruit Rot. (Six applications of 19 fungicides between July 11 and September 6 -- J. D. Wilson, Wooster)

Again the coppers in general gave best control of late appearing *Phytophthora* fruit rot, in following order: (1) Bordeaux 8-6-100, Robertson Cu 2.2-100, Tribasic 4-100, MnEBD + Triton 1.7-.1-100, (2) Parzate + ZnSO_4 4-1-100, Cop-O-Zink 4-100, COCS 4-100, (3) Crag 658 2-100, Methasan S 1-100, Parzate 2-100, (4) poor control achieved with Zerlate, Orthocide, Vancide 51, and Zac X6.

However, the coppers gave little control of anthracnose fruit rot which was controlled better by Methasan slurry, and MnEBD, and Liquid Parzate.

South Carolina (Charleston; hand dusters; 4 applications)

(See data under Stemphylium blight.)

Virginia (Blacksburg; knapsack dusters; 13 applications; variety Rutgers)

Control: (1) Parzate (3.9%), Parzate (20%), Robertson copper (7%); (2) Cop-O-Zink

(7%), Tribasic copper (7%), Crag 658 (6%), Phygon (1%).

Plant Safety: (1) Parzate, Cop-O-Zink, Tribasic copper, Robertson copper; (2) Crag 658; (3) Phygon.

Yield: (1) Parzate, Cop-O-Zink; (2) Tribasic copper, Robertson copper, Crag 658; (3) Phygon.

Overall Preference: (1) Parzate, Robertson copper; (2) Cop-O-Zink, Tribasic copper; (3) Crag 658; (4) Phygon.

Parzate (20%) would be too expensive at rate used. Phygon was toxic at heavy rate used in test. All materials were used in excessive amounts in this test.

West Virginia (Huttonsville; hydraulic sprays; 14 applications at weekly intervals; variety Marglobe)

Control: (Defoliation) (1) Parzate; (2) Parzate-C & H copper; (3) Parzate-Tribasic copper; (4) bordo; (5) Methasan-Tribasic, Tribasic; (6) Methasan + Tribasic; (7) Methasan + C & H copper; (8) C & H copper; (9) Cop-O-Zink.

Control: (Fruit Rot) (1) bordo; (2) Parzate-Tribasic, Parzate; (3) Methasan-Tribasic, Tribasic; (4) Methasan + Tribasic; (5) Parzate-C & H copper; (6) C & H copper; (7) Cop-O-Zink; (8) Methasan + C & H copper.

Plant Safety: Apparently only bordo 8-4-100 showed any injury.

Yield: (1) Parzate-Tribasic; (2) Parzate; (3) Parzate-C & H copper; (4) bordo; (5) Methasan-Tribasic; (6) Tribasic; (7) Methasan + Tribasic; (8) Cop-O-Zink; (9) C & H copper; (10) Methasan + C & H copper.

Overall Preference: (1) Parzate-Tribasic, Parzate; (2) Parzate-C & H copper, bordo; (3) Methasan-Tribasic, Tribasic; (4) Methasan + Tribasic; (5) Cop-O-Zink; (6) C & H copper; (7) Methasan + C & H copper.

STEMPHYLIUM BLIGHT

Maryland (Salisbury; hydraulic sprays; 7 applications; variety Rutgers)

See data under Early Blight.)

Maryland (Salisbury; Campbell Soup Co.; hydraulic sprays; 7 applications; variety Garden State)

Control: (1) Z-78; (2) Zerlate + Z-78; (3) Zerlate, Z-T-Z-T-Z-T-Z, Zerlate + Crag 658; (4) Tribasic, Zerlate + Tribasic; (5) Z-Z-Z-T-T-T; (6) Orthocide 406.

No data on plant safety.

Yield: (1) Zerlate + Crag 658, Zerlate, Z-T-Z-T-Z-T-Z, Zerlate + Tribasic, Z-78, Tribasic, Z-Z-Z-T-T-T-T, Zerlate + Z-78; (2) Orthocide 406.

No overall preference indicated.

South Carolina (Charleston; hand dusters; 4 applications; varieties Rutgers and Ontario)

Control: Too little late blight for evaluation of materials. Gray leaf spot caused complete defoliation, but only after harvest was completed; applications stopped too soon to control it.

Plant Safety: (1) Parzate (3.9%), Z-78 (3.9%), Orthocide 406 (5%); (2) Phygon XL (1%); (3) Tribasic (6%).

Yield differences not significant.

Overall Preference: (based on previous years' tests) (1) Tribasic; (2) Parzate, Z-78; (3) Phygon XL.

SEPTORIA BLIGHT

Missouri (Columbia; hydraulic sprays; 10-day interval applications; variety Rutgers)

(See data under Late Blight.)

Illinois (Ridgefarm; hydraulic sprays; 6 applications; variety, Indiana Baltimore)

Control: (1) Mn bis; (2) bordo 8-4-100; Tribasic + Zerlate, Tribasic, Z-78; (3) T-Z-T-Z-T-Z, Crag 658, Orthocide 406.

No data on plant safety.

Yield: Yield differences not significant.

No data on overall preference.

PHOMA LEAFSPOT

Louisiana (Baton Rouge; hydraulic sprays and hand dusts; 8 applications; variety Marglobe)

Control: (1) Tribasic; (2) Z-78; (3) Crag 658; (4) dusts of Tribasic (7%), Z-78 (6%), Crag 658 (6%).

Plant Safety: (1) Z-78; (2) Z-78 dust; (3) Crag 658, Crag 658 dust; (4) Tribasic dust; (5) Tribasic.

Yield: (1) Z-78; (2) Crag 658; (3) Crag 658 dust; (4) Z-78 dust; (5) Tribasic; (6) Tribasic dust.

Overall Preference: (1) Z-78; (2) Crag 658; (3) Crag 658 dust; (4) Z-78 dust.

PEPPER

ANTHRACNOSE

Maryland (Hurlock; hydraulic sprayer; 5 applications; variety California Wonder)

Control: No disease data.

Plant Safety: (1) Orthocide 406, Z-78; (2) Tribasic copper.

Yield: (1) Orthocide 406, Z-78; (3) Tribasic.

Overall Preference: (1) Orthocide 406, Z-78.

CUCURBITS

Cucumber

ANTHRACNOSE, SCAB, DOWNY MILDEW
Louisiana (Hammond; hand duster; 4-6 day applications; variety Marketer; disease -- downy mildew)

Control: (1) Z-78 (8%); (2) Tribasic (7%); (3) Parzate (8%); (4) Fermate (8%); (5) Orthocide 406 (8%); (6) Crag 658 (8%).

Plant Safety: (1) Z-78; (2) Fermate; (3) Parzate; (4) Orthocide 406, Crag 658, Tribasic.

Yield differences not significant.

Overall Preference: (1) Z-78; (2) Fermate; (3) Parzate; (4) Orthocide 406; (5) Tribasic; (6) Crag 658.

South Carolina (Charleston; hand duster; 8 applications; variety Palmetto; diseases -- downy mildew, anthracnose)

Control: -- Downy Mildew -- (1) Tribasic (5.3%); (2) Z-78 (3.9%), Parzate (3.9%), Orthocide 406 (5%), Phygon XL (1%); (3) Fermate (8%).

Control: -- Anthracnose -- (1) Orthocide 406; (2) Z-78, Parzate, Fermate; (3) Phygon XL, Tribasic.

Plant Safety: (1) Z-78, Parzate, Orthocide 406; (2) Fermate, Phygon XL, Tribasic.

Yield: (1) Parzate; (2) Z-78, Orthocide 406; (3) Fermate; (4) Phygon XL; (5) Tribasic.

Overall Preference: (1) Z-78, Parzate, Orthocide 406; (2) Tribasic; (3) Fermate, Phygon XL.

Notes: Palmetto mildew-resistant, but mildew serious in spite of resistant variety. Phygon and Fermate not considered worth further testing. Orthocide looked very good, particularly against anthracnose, but this represents only one year's test. Zineb will be recommended for 1951 as it was in 1949 and 1950.

North Carolina (Faison; dusts and sprays; weekly applications; variety Palmetto; diseases -- severe anthracnose, moderate downy mildew)

Control: (1) Zerlate (8%), Z-78 (8%), Tribasic spray, Zerlate-Tribasic; (2) Fermate (8%); (3) Tribasic (5%).

Plant Safety: (1) All materials equally safe, Fermate and Zerlate the safer.

Yield: (1) Zerlate; (2) Z-78; (3) Tribasic spray; (4) Zerlate-Tribasic; (5) Fermate; (6) Tribasic.

Overall Preference: (for anthracnose control on mildew-resistant varieties in fall crop)

(1) Zerlate, Z-78, Tribasic spray, Zerlate-Tribasic; (2) Fermate; (3) Tribasic.

Note: While there is some interest in fall cucumbers, the main crop is grown in the spring when downy mildew rather than anthracnose is the major disease. Downy mildew-resistant varieties are not adapted for the spring crop and Tribasic is recommended.

Missouri (Columbia; hydraulic sprays; 10-day interval applications; variety Earliest-of-All; diseases -- anthracnose, downy mildew)

Control: (1) Zerlate, Z-78; (2) Fixed copper.

Plant Safety: (1) Zerlate, Z-78; (3) Fixed copper.

Yield: (1) Zerlate, Z-78; (3) Fixed copper.

Overall Preference: (1) Zerlate, Z-78. Considerable injury occurred with the Fixed copper in combination with Lindane.

Michigan (East Lansing; hydraulic sprayer; 4 applications; variety National Pickling; disease -- scab)

Control: (1) C & C 5400; (2) Actidione*, Actidione**, Crag 658.

Plant Safety: (1) C & C 5400, Crag 658; (2) Actidione*, Actidione**.

Yield: (1) Crag 658; (2) Actidione*; (3) C & C 5400; (4) Actidione**.

Overall Preference: (1) Crag 658, C & C 5400.

Some phytotoxicity with the actidiones. Very poor growing year -- cold and wet. Heavy scab epidemic with only slight control in any treatment.

(*10 P. P. M.; **30 P. P. M.)

Muskmelon

Michigan (East Lansing; hydraulic sprayer; 4 applications; variety Honey Rock; disease -- *Macrosporium* leaf spot)

Control: Data inconclusive.

Plant Safety: (1) C & C 5400, Crag 658; (2) Actidione*; (3) Actidione**.

Yield data not significant.

No overall preference based on 1951 results.

(*10 P. P. M.; **30 P. P. M.)

Maryland (Hurlock; hydraulic sprayer; 6 applications; variety Hales Best; diseases -- *Macrosporium* leaf spot and downy mildew)

Control: (1) Orthocide 406, Zerlate; (2) Tribasic; (3) C & H copper; (4) Z-78; (5) Robertson copper, Crag 658; (6) Tribasic (delayed applications); (7) Z-78 (delayed application).

Plant Safety: (1) Z-78, Orthocide 406, Zerlate, Z-78 (delayed applications); (2) Crag 658; (3) Tribasic, Robertson copper, C & H copper.

Yield: (1) Orthocide 406; (2) Zerlate; (3) Z-78, Robertson copper; (4) C & H copper; (5) Crag 658; (6) Tribasic; (7) delayed applications of Z-78 or Tribasic.

Overall Preference: (1) Z-78, Zerlate; (2) Orthocide 406; (3) Robertson copper, C & H copper; (4) Tribasic; (5) Crag 658.

Delayed applications; sprays delayed until downy mildew appeared on July 28 and then applied July 28, August 4, and August 11.

Watermelon

Florida (Leesburg; hydraulic sprays; 7-day interval applications; variety Cannon Ball; disease -- downy mildew)

Control: Control equally good with the following: Z-78 (2 lbs./100 or 1 1/2 lbs./100), Parzate (2 lbs./100 or 1 1/2 lbs./100), Phygon (1/2 lb./100 or 1/2 lb. + 1/2 lb./100 MgSO₄).

No phytotoxicity. No yield data.

Overall Preference: Z-78 or Parzate because they will control anthracnose and gummy-stem blight. Phygon XL is untested against these.

Florida (Leesburg; hand dusters; 7-day interval applications; variety Cannon Ball; disease -- downy mildew)

Control: Compared Z-78 dust, containing 3%, 4%, 5%, 6%, and 8% active ingredient; also Parzate dust containing 6.5% active ingredient. Equal control with all percentages except 3%, which was too low for adequate mildew control. All materials equally safe. No yield data taken.

Overall Preference: Z-78 at 4%, 5%, or 6%, Parzate at 6.5%. Z-78 at 8% too high.

SOIL TREATMENTS FOR CONTROL OF NEMATODES IN 1950

CONTRIBUTORS REPORTING

| State | Contributor | Location of tests |
|----------------|------------------------------|-------------------|
| Connecticut | Anderson, P. J. | Windsor |
| Delaware | Crittendon, H. W. | Bethel |
| Florida | Christie, J. R. | Sanford |
| | Perry, V. G. | |
| | Kincaid, R. R. | Quincy |
| | Clark, Fred, Myers, J. M. | Gainesville |
| | Conover, R. A. | Homestead |
| | Wolfenbarger, D. O. | |
| Georgia | Boyle, L. W. | Experiment |
| Maryland | Cox, C. E. | Salisbury |
| | Scott, L. E. | |
| | Matthews, W. A. | |
| New York | Lear, Bert | Ithaca |
| South Carolina | Epps, W. M. | Charleston |
| | Graham, T. W. | Florence |

SOIL TREATMENTS FOR THE CONTROL OF NEMATODES

At Windsor, Connecticut, fumigants were applied 6 inches deep in sandy loam soil by a tractor-drawn shank applicator. Dowfume N was applied at 25 gal./acre, Iscobrome D at 30 gal./acre, and Dowfume W-40 at 15 gal./acre. Treatments were made in May and September 1949, and cigar leaf tobacco plants were set in June 1950. Most effective control of meadow nematodes was achieved with Iscobrome D and Dowfume W-40. Some impairment of burn quality was caused by Dowfume N treatments.

At Bethel, Delaware, fall applications of DD mixture were made 6 inches deep in a sandy soil with hand injectors at rates of 13, 21, and 34 gal./acre. A spring application of 21 gal./acre, a combination fall and spring application totaling 42 gal./acre of DD mixture, and a fall application of Iscobrome D at 29 gal./acre completed the treatments.

One month following the spring applications, two varieties of cantaloupe were planted on each of the 25 x 100 foot plots. Control of root-knot nematode was best on plots receiving 42 gal./acre of DD mixture in the combination fall and spring application. However, the lowest yields were obtained from these plots. Highest yields were obtained from fall treatments of DD mixture at 13 and 21 gal./acre and Iscobrome D at 29 gal./acre.

At Sanford, Florida, tests were conducted in quart fruit jars of sandy soil containing miscellaneous soil nematodes. The volatile materials were injected in the soil and the non-volatile materials mechanically mixed with the soil. Treatments included dosages of 0.5, 1, 2, 4, and 8 ml. of each of the following:

- 1-(3,4-dichlorobenzyl)-1-methyl-2-(3-pyridyl)-pyrrolidinium chloride
- 1-butyl-2-methyl-2-(3-pyridyl)-2-pyrrolidinium thiocyanate
- didoceyl nicotinium dipicrate

1-dodecyl-2-methyl-2-(3-pyridyl)-pyrrolidinium chloride
 1-(2,4-dichlorobenzyl)-1-methyl-2-(3-pyridyl)-pyrrolidinium chloride
 bis (diethyl nicotinium dibromide)
 8-phenyl-mercuridix-quinoline
 maleic acid
 diethylene glycol butyl ether ester of acetic acid
 anisalacetone
 benzoic acid (allyl ester)
 azoxybenzene
 p-aminodiphenyl
 benzoic acid
 p-aminobenzoic acid (methyl ester)
 ammonium dinitro-o-cresylate
 acetic acid (3,4-dichlorobenzyl ester)
 anisaldehyde
 acrylic acid (beta-phenoxyethyl)
 acrylic acid (beta benzyloxyethyl ester)
 anthranilic acid (methyl ester)
 1-hexadecyl-1-methyl-1-2-(3-pyridyl)-pyrrolidinium thiocanate
 acrylic acid (tetrahydrofurfuryl ester)
 anisic acid (methyl ester)
 1-hexadecyl-1-methyl-2-(pyridyl)-pyrrolidinium bromide
 1-hexadecyl-1-methyl-2-(pyridyl)-pyrrolidinium-toluene-sulfonate
 bis (3,4-dichlorobenzyl) nicotinium dichloride
 DD mixture
 Soilfume 80-20
 Fumigant H-9136
 Fumigant 406-J
 Fumigant 406-J (emulsifiable)
 Fungicide 275-E
 Metacide
 Neo-Vita
 Pestox
 paradichlorobenzene

One additional test was conducted in fumigating boxes with tight covers and in greenhouse flats. Chemicals used were Atlas Fumigant A, Atlas Fumigant B, cyclohexane, synthetic hexane, ammonium dinitro-o-cresylate, dibromobutene, cyclohexyl bromide, allyl acetone, petroleum hexane, and cyclohexyl chloride. The most effective materials as based on the number of living nematodes recovered from 1/2 pint of soil by a combination of decanting, sieving, and the Baermann technic were benzoic acid (allyl ester) 4 ml., azoxy-benzene 8 ml., ammonium dinitro-o-cresylate 2 ml., acetic acid (3,4-dichlorobenzyl ester) 4 ml., DD mixture 0.5 ml., Soilfume 80-20 1 ml., H-9136 0.5 ml., Fumigant 406-J 2 ml., Fumigant 406-J (emulsifiable) 1 ml., and dibromobutene 1 ml.

At Quincy, Florida, field applications in a fine sandy loam of 16° C. at 6- to 8-inch

depth were made with DD mixture at 10 and 20 gal./acre, Dowfume W-40 at 8 and 16 gal./acre, chlorobromopropene at 18 gal./acre, and dichlorobutene at 18 gal./acre. Control of root-knot nematode on cigar-wrapper tobacco plants set one month after treatment was best and the highest yields were obtained with DD mixture and Dowfume W-40 at all rates used. No material gave weed control and slightly retarded growth resulted on the DD mixture treatment at the 20 gal. dosage.

At Gainesville, Florida, field treatments of nematode-infested land were made three weeks before setting tobacco plants. Methyl bromide was applied with a "jiffy applicator" at 1 lb./100 square feet. Ethylene dibromide at 7 to 8 gal./acre and DD mixture at 8 to 10 gal./acre were applied in drill rows 3.5 ft. apart with a gravity flow applicator at 8- to 9-inch depth in a fine sandy soil at 60° F. Excellent root-knot nematode control and weed control were obtained with methyl bromide and the ethylene dibromide gave slightly better nematode control than DD mixture.

At Homestead, Florida, treatments were made in a root-knot nematode infested field by spring applications of calcium cyanamide at 2000 lbs./acre, broadcasted and disced in the soil, DD mixture at 306 lbs./acre, and Dowfume W-40 at 311 lbs./acre applied 4 to 6 inches deep with a tractor-drawn applicator with outlets one foot apart. MC-2 at 910 lbs./acre released beneath Sisalkraft paper was used in the fall, and a summer treatment of two applications of Chipman 2-4 D amine 67% plus 300 lbs./acre of sodium chlorate completed the treatments. The soil involved was a Perrine marl (a finely divided calcareous soil of pH8). Results were obtained from roots of volunteer potatoes and yields obtained from potatoes planted in November and dug the following March. MC-2 was most effective in the control of nematodes, producing 95 percent marketable tubers compared to 16 percent in the check plots. No control was achieved with DD mixture, Dowfume W-40, or calcium cyanamide. Complete weed control was obtained from the MC-2 treated areas. A second test was made with replicated dosages of DD mixture applied at 1608, 494, 335, and 176 lbs./acre applied in the spring with a tractor-drawn applicator having outlets one foot apart. There were no significant differences among treatments as regards nematode control, yield, or effect on weeds.

At Salisbury, Maryland, DD mixture was applied at 60 gal./acre to field soil with a tractor-drawn applicator at a 6-inch depth. Rain after the applications was the only surface seal. Six to eight weeks following treatment sweet-potatoes, tomatoes, snapbeans, and cantaloupes

were planted on the plots. Good weed control, especially of crabgrass, was obtained. Control of root-knot nematode and wireworms was also good. There were also indications of an indirect effect on reduction of "growth cracking" in sweetpotatoes.

At Ithaca, New York, replicated glazed gallon crocks of root-knot nematode infested soil were treated with the following chemicals: Dowfume G, 3 ml.; Dowfume W-40, 1.5 ml.; dichlorobutenes, 0.5 and 1 ml.; chlorobromopropene, 0.5 and 1 ml.; DD mixture, 1 ml.; Dow H-9138, 1.5 ml.; Formulation 118, 1 ml.; and DD-chloropicrin, 1 ml.; Parathion (15% wettable powder), 75 mgm.; chlorobutenes, 1 and 2 ml.; and Metacide, 75 and 300 mgm. A surface seal was applied by the application of 100 ml. of water to each crock. Three weeks following treatment three squash seeds were planted in each crock and the number of nematode galls present on the squash roots five weeks later counted as an estimate of treatment efficacy. Most effective treatments were Dowfume G, Dowfume W-40, dichlorobutenes, chlorobromopropene, Dow H-9138, and DD-chloropicrin mixture. In a second experiment, a 10% liquid formulation of dichlorobutenes at 2 and 5 ml., a solid formulation of 10% dichlorobutenes at 2 and 5 grams, and 1,3-dichloro-1-butene at 0.5 ml. per gallon crock were applied to replicated gallon glazed crocks of root-knot nematode infested soil. All gave eradication of root-knot nematode as based on gall counts on roots of squash indicator plants sowed three weeks following treatment.

At Florence, South Carolina, the following materials were applied to root-knot nematode infested soil by surface drench: allyl alcohol (6 qts.) plus sodium azide (6 lbs.) per 100 sq. yd.; uramon (100 lbs.) plus calcium cyanamide (50 lbs.) per 100 sq. yd.; dichlorobutene (40 gm.) per sq. yd.; and allyl alcohol (6 quarts) per 100 sq. yd. Methyl bromide at 1 lbs./100 sq. ft. was released beneath a gas-proof cover, and a second methyl bromide treatment in which tobacco seed was sowed 6 to 24 hours after treatment. Chemical treatments were compared with steam applied beneath an inverted pan, and the untreated check. Treatments were made in October in sandy soil and tobacco seed was sown in February. Root-knot

nematode control was best with methyl bromide, allyl alcohol plus ethylene dibromide, and uramon plus calcium cyanamide. The number of plants per square foot was higher in the allyl alcohol plus sodium azide and the uramon plus calcium cyanamide treated plots.

SOIL TREATMENTS TO CONTROL FUNGI

At Experiment, Georgia, chlorobromopropene at 15 and 25 gal./acre was applied to soil in 8 cubic foot containers with packets of Sclerotium rolfsii sclerotia buried throughout the soil. Injections were made 6 inches deep and a water seal applied. Fungicidal properties were too limited and erratic, especially in heavier soils, to be of practical importance.

At Ithaca, New York, replicated glazed gallon crocks of club-root infested soil were treated with dibromobutene at 1, 5, and 10 grams, Vancide 51 (1% water solution) at 100, 200, and 500 ml., dichlorobutenes at 1 and 2 ml., and acrylon nitrile at 1 ml./gallon crock of soil. No surface seal was used. Cabbage indicator plants were set three weeks following treatment. Most effective treatments were acrylon nitrile, dichlorobutenes, dibromobutene at the 10 gram dosage, and Vancide 51 at 500 ml. per crock. A field-scale experiment was conducted with dichlorobutenes at 3 ml. and chlorobromopropene at 2 and 3 ml. per injection, applied 4.5 inches deep on staggered 10-inch centers with hand injectors. Indicator cabbage plants scored three months later showed the following mean root scores on basis of 0 to 5: Check, 4.56; dichlorobutenes (3 ml.), 2.53; chlorobromopropene (3 ml.), 2.35, and (2 ml.), 3.33. Severe injury was evident on the plots receiving the dichlorobutenes.

At Charleston, South Carolina, chlorobromopropene at 20 gal./acre and chloropicrin at 50 gal./acre were applied 5 inches deep with hand injectors to sandy soil containing damping-off organisms, especially Sclerotinia sclerotiorum. Within one hour of treatment the surface was sealed with 1/4 inch of rain. Stand counts of lettuce sowed six weeks after treatment showed both treatments effective as regards stand with chloropicrin giving the best pest control. Excellent control of Stellaria media and Lamium amplexicaule was obtained with chloropicrin.

FUNGICIDE EVALUATION STUDIES ON ORNAMENTAL PLANTS 1950

GLADIOLUS DISEASES

Data reported are results of national cooperative corm treatment tests sponsored by the American Gladiolus Council and the North American Commercial Gladiolus Growers. Cooperators were: Jack Scott, Clarkesville, Georgia; J. L. Forsberg, Urbana, Illinois; A. F. Sherf and C. H. Sherwood, Ames, Iowa; W. D. McClellan, Beltsville, Maryland; J. R. Keller and A. W. Dimock, Ithaca, New York; A. A. Foster, Farmingdale, New York; F. A. Haasis, Wilmington, North Carolina; and H. A. Runnels, Wooster, Ohio.

Materials used were:

(a) for Fusarium brown rot control on variety Corona:

1. New Improved Ceresan, 1 oz., plus Dreft, 2 tblsp./3 gals., 15 min. soak.
2. Dow 9B, 3 oz./3 gals., 15 min. soak.
3. Arasan, full strength dust.
4. Dow 9B, full strength dust.
5. Natriphene, 14.2 grams/3 gals., 1 hr. soak.
6. Dowicide B, 6 oz./3 gals., 15 min. soak.
7. Phygon XL, full strength dust.
8. Spergon Gladiolus Dust, full strength dust.
9. Ceresan M, 1 oz./3 gals., 15 min. soak.
10. Tag 331, 60 ml./3 gals., 15 min. soak.
11. Phenyl Mercury Fixtan, 11.4 grams/3 gals., 15 min. soak.

(b) for bacterial scab and Sclerotinia dry rot control:

1. Mercuric chloride, 11.4 grams/3 gals., 2 hr. soak.
2. Mercuric chloride, 11.4 grams/3 gals., 14 hr. soak.
3. Semesan, 113.5 grams/3 gals., 3 hr. soak.
4. Phenyl Mercury Fixtan, 11.4 grams/3 gals., 2 hr. soak.
5. Calogreen, 9.6 oz./3 gal., brief dip.
6. Tag 331, 60 ml./3 gals., 2 hr. soak.
7. Mercuric chloride, 11.4 grams plus New Improved Ceresan, 1 oz., plus Dreft, 2 tblsp./3 gals., 30 min. soak.

Records were taken on stand, flower production, date of bloom, corms harvested, rot-free corms in the Fusarium test, and scabby corms and corms with Sclerotinia dry rot in the scab test.

Results, Fusarium test: On the bases of

flower production, corm production, and rot-free corms, only Tag 331 and Phenyl Mercury Fixtan consistently failed to show highly significant improvement over the controls. Natriphene was low in corm production and in rot-free corms in most cases, and Spergon Gladiolus Dust was often low. No one material was clearly superior but New Improved Ceresan, Dowicide B, Arasan dust, Dow 9B soak, and Ceresan M were generally most effective. In no case was any material significantly superior to New Improved Ceresan, the most common material in current commercial usage. Ceresan M was consistently inferior to New Improved Ceresan. Dow 9B dust was the only material causing injury, this being reflected in emergence, total bloom, and time from planting to bloom.

Results, scab and Sclerotinia test: Tag 331 was apparently injurious to the variety Snow Princess, reducing emergence and bloom production and delaying bloom. There were no significant differences in scab except in Ohio, where mercuric chloride (14 hrs.), Semesan, and Tag 331 apparently gave best control. Differences in Sclerotinia dry rot were not significant.

Gladiolus corm treatments: Additional data on 1950 gladiolus corm treatments were supplied by J. L. Forsberg, Urbana, Illinois. The tests were conducted in cooperation with the Kankakee County Gladiolus Growers Association.

In tests of corm treatments for the control of Fusarium rot a soak of 2 hours or more in Natriphene (1 to 800) gave good control whereas a 15-minute soak was ineffective. Dow 9B was effective at both 3 ounces and 4 ounces to 3 gallons; Arasan dusted on the corms prior to planting and dusted in the furrow after dropping the corms were both effective, the former method giving the better results; Phenyl Mercury Fixtan was of questionable value; and New Improved Ceresan, as usual, was effective.

In corm treatments for bacterial scab control involving 10 varieties, HgCl₂ at 1 to 1000, 2 hr. and 14 hr. soak; HgCl₂ at 1 to 1000 plus N. I. Ceresan at 1 oz./3 gals. plus Dreft at 2 tblsp./3 gals., 30 min. soak; HgCl₂ at 1 to 1000 plus Ceresan M at 1 oz./3 gals., 30 min. soak; and HgCl₂ at 1 to 1000 plus Phenyl Mercury Fixtan at 5 gms./3 gals., all gave very good control. The HgCl₂ 2 hr. soak and the HgCl₂ plus P.M.F. were usually somewhat less effective than the other three treatments. N. I. Ceresan, Natriphene, and P.M.F. alone were not effective.

Additional scab tests involving three varieties showed excellent control with HgCl₂, 2- and 14-hour soaks, HgCl₂ plus N. I. Ceresan, 30

min. -soak, and Calogreen (HgCl₂), 9.6 oz./3 gals., 1 min. -dip. Semesan at 113.5 gms./3 gals. and Tag 331, 60 ml./3 gals., 2 hr. -soak gave somewhat less effective control. Phenyl Mercury Fixtan was ineffective.

In tests of pre-storage treatments with and without preplanting treatments for control of Fusarium dry rot, Arasan, Dow F-800, Dow 9B, and Spergon, each mixed with equal parts 5% DDT; Dow 9B, 1 part, Fermate, 1 part, 5% DDT, 4 parts; Natriphene, one 73 grain tablet plus 27 grams wettable DDT in 2 1/2 gals. water; and 5% DDT were used as pre-storage treatments, with N. I. Ceresan at standard dosage as the preplanting treatment in each case.

Although the results lacked statistical significance, nearly all prestorage treatments reduced the amount of storage rot. Dow 9B alone or with Fermate appeared to be slightly superior to the other treatments. With these treatments and with Dow F-800, control of rot during the growing season was excellent, and the use of the pre-planting treatment with N. I. Ceresan improved the control only with one lot of Picardy in which heavy storage losses had also occurred. With Arasan pre-storage treatment, the use of N. I. Ceresan pre-planting treatment in most cases resulted in greatly reduced control, whereas with Spergon and Natriphene pre-storage treatments, the pre-planting treatment in all cases improved control.

Prestorage corm treatments for Fusarium brown rot control reported by Frank A. Haasis indicated good results and plant safety with a 5-minute steep in Dow 9B suspension at 3 lbs./100 gals.

Preplanting corm dips for control of Sclerotinia dry rot were reported by C. J. Gould. Tersan (1 lb./6 gals. -- 1 hr.) was rated best of the materials tested on the basis of disease control and plant safety. Mersolite W (1 lb./241 gal., 1 lb./482 gal., 1 lb./723 gal. -- 1 hr.) gave best disease control but caused delay in emergence and bloom. Disease control improved and plant safety decreased as the concentration of active ingredient increased. Natriphene (1 lb./96 gal., 1 lb./193 gal. -- 1 hr.) failed to give adequate control.

CARNATION DISEASES

Soil treatments: E. F. Guba and R. W. Ames reported results of soil drenches for Rhizoctonia stem rot control. New Improved Ceresan (6 weekly treatments at 0.78 oz./100 sq. ft.) gave best control and yield followed by Fermate and Semesan (both at 6 treatments of 3.10 oz./100 sq. ft.).

Pfizer's Mercurial Mixture and mercuric chloride both caused injury, and Phygon XL and Semesan Bel failed to give adequate control.

Soil treatments for control of Fusarium wilt and branch rot of carnations were reported by W. D. Thomas, Jr. and J. G. Zoril. Best disease control was given by Dithane Z-78 (4 oz./100 sq. ft.), followed by a *Trichoderma lignorum* extract (7% soln.; 2 oz./100 sq. ft.). Crag 658 and Goodrite Zac were quite injurious. Dithane Z-78 applied during high temperature periods caused excessive apparent stimulation of growth.

H. Murakishi and J. W. Hendrix, in Honolulu, obtained excellent control of Fusarium root rot and wilt of carnations in greenhouse flats by drenching the soil with Dithane Z-78 (1 to 200), using approximately 3 pints per square foot. Treatments were made one week before planting, at planting, and again one month after planting. Bioquin 1 (Technical), Copper A, Puratized 111-5, Puraturf, Natriphene, and Quinate were wholly ineffective.

Foliage sprays: C. A. Davis, Jr. and A. W. Dimock at Ithaca, New York, tested 12 materials for control of *Alternaria dianthi* in replicated small field plots. Applications were made about once a week from June 22 to September 15, final notes being taken September 27.

Best control was obtained with Bioquin 1 (1 lb./100 gal.), Vancide 51 (2 qts./100 gal.) plus zinc sulfate (1 lb./100 gal.), and Orthocide 406 (1 lb./100 gals.). Bioquin 1 and Orthocide 406 ranked 1 and 2 in similar tests last season. Good control was obtained with Dithane Z-78 (1 lb./100 gals.), Phygon XL (1 lb./100 gals.), Vancide 51 (2 qts./100 gals.), and Puratized Agricultural Spray (1 pint/100 gals.). Fair to poor control was obtained with Fermate (1 lb./100 gals.), Crag 341C (1 qt./100 gals.) plus lime (0.5 lbs./100 gals.), Crag 341SC (1.5 qts./100 gals.) plus lime (0.5 lbs./100 gals.), Zerate (1 lb./100 gals.), and Tag 331 (0.5 pint/100 gals.). Plants sprayed with Crag 341C and with Tag 331 were seriously stunted.

ROSE DISEASES

Blackspot (*Diplocarpon rosae*). At Beltsville, Maryland, tests of 19 materials or combinations in dust form were conducted by W. D. McClellan and F. F. Smith, using small plots of Better Times and Talisman. With both varieties best disease control was obtained with mixtures containing dusting sulfur (usually about 75%) and either copper (10%) or Fermate (10%). All mixtures also contained 5% DDT and usually 1 to 5% of some experimental acaricide. Sulfur without copper or Fermate was not tested. Dusts containing 1% Phygon, without sulfur,

failed to give adequate disease control.

An interesting observation was that with both varieties total flower production was with considerable consistency inversely correlated with degree of disease control. No estimate of the quality of the blooms was reported.

At Ithaca, New York, about 30 spray and dust treatments were tested by L. M. Massey and C. A. Davis, Jr. Small plots, each containing 2 plants of each of 6 varieties were employed, with 4 replicates of each treatment. Sprays were applied with a power sprayer and dusts with a hand duster. Applications were made weekly from July 5 until mid-October. Briefly summarized, outstanding results, as in two previous seasons, were obtained with manganese ethylene bis dithiocarbamate spray (1 1/2 lbs./100 gals.). This gave excellent control, with only slight injury during a hot, humid spell. Also outstanding were COCS dust (5% Cu plus 0.75% rotenone) and COCS (2 lbs./100 gals.) plus sulfur (2 lbs./100 gals.) spray. Excellent control was given by these treatments though injury occurred during cool, wet weather.

Very good control was also given by Orthocide 406 (2 lbs./100 gals.), Ortho Rose Dust (containing 6.7% ferbam, 40% sulfur), Farmrite Rose Dust (containing 9.1% zineb), Jackson and Perkins Rose Dust (containing ferbam, sulfur, and Bioquin 1), and Dithane Z-78 (1 lb. per 100 gals.) plus Karathane. Orthocide 406 produced some injury on Crimson Glory and Pinochio. The other materials caused no evident injury.

Fair control was obtained with Triogen Dust, J. & P. Rose Spray, Sears Rose Dust, Urea with sulfur, Bioquin 1 with sulfur, Bioquin alone, Farmrite Spray, Crag 341SC, and sulfur alone.

Poor results were obtained with Rix with sulfur, TMTD, Ortho Rose Spray, Triogen Spray, and Ortho-Rix.

Tag 331 (1/4 pint/100 gals.) gave excellent eradication when applied after rains but caused considerable injury. Lime-sulfur (1/100) after rains also proved effective in control but was quite conspicuous and injurious.

It is of interest that in all cases where materials were tested both as sprays and dusts, the dust treatments gave better results.

Powdery mildew (*Sphaerotheca pannosa* var. *rosae*). Greenhouse spray trials conducted by W. D. McClellan showed best control of powdery mildew on var. Starlite with Arathane or Karathane at 1/2 lb./100 gals. plus Santomerse S at 1 to 2000. Good control was also obtained with Arathane at 1/4 lb./100 gals. plus wettable sulfur at 2 lbs./100 gals. and with wettable sulfur at 2 lbs./100

gals., both with Santomerse S at 1 to 2000. Arathane and Karathane under some conditions caused mild injury.

SNAPDRAGON RUST

Replicated small-plot spray tests conducted by C. A. Davis, Jr. and A. W. Dimock at Ithaca, New York, showed excellent control with Crag 341SC (1.5 qt. plus 1/2 lb. lime/100 gal.), Crag 341C (1 qt. plus 1/2 lb. lime/100 gal.), and Dithane Z-78 (1 lb./100 gal.). Crag 341C caused considerable stunting and downward curling of the leaves, whereas Crag 341SC caused very little injury. Dithane Z-78 was not injurious.

Fair control was obtained with Zerlate, Phygon XL, Vancide 51 (2 qts./100 gal.), and Vancide 51 (2 qts./100 gal.) plus zinc sulfate (1 lb./100 gals.). Fermate (1 lb./100 gal.), Puratized Agricultural Spray (1 pint/100 gals.), Bioquin 1 (1 lb./100 gal.), and Orthocide 406 (1 lb./100 gals.) gave poor control. Both Puratized Agricultural Spray and Tag 331 caused serious stunting, the latter being discontinued after a few treatments.

CHRYSANTHEMUM DISEASES

Leafspot (*Septoria obesa*). In tests by C. A. Davis, Jr. and A. W. Dimock at Ithaca, New York, excellent control was obtained in replicated small plots with Zerlate, Fermate, Dithane Z-78, Bioquin 1, Orthocide 406, Phygon XL (all at 1 lb./100 gals.), Crag 341SC (1 1/2 qts./100 gals.) plus lime (0.5 lb./100 gals.), and Vancide 51 (2 qts./100 gals.) plus zinc sulfate (1 lb./100 gals.). Poor control was obtained with Crag 341C, Tag 331, and Puratized Agricultural Spray.

Foliar nematode (*Aphelenchoides* sp.). New phosphate insecticides were tested by J. R. Keller and A. W. Dimock at Ithaca, New York for foliar nematode control. Parathion, Pestox III, and Systox were used both as foliage sprays and as soil drenches. There were three ten-plant plots for each treatment. All plots were inoculated with nematode material on June 26 and August 9 and spray or drench treatments made on June 28, and with some plots again on August 11. Parathion 15% w.p. was used as a spray at 1 and 1 1/2 lbs./100 gals., and the soil drench used .2 grams active per 1000 sq. ft. Pestox III and Systox were used at 0.5 lbs./1000 sq. ft. both as foliage sprays and as soil drenches. Very good control was obtained with Systox where both the first and second treatments were made, whereas control was only fair where the second treatment was omitted. There was no observed difference between soil and foliage treatments. Parathion gave good

control at both spray dosages and also when used as a soil treatment, there being no differences due to method of treatment. Pestox III gave good control as a spray, only fair control as a soil treatment.

IRIS

Leafspot (*Didymellina macrospora*).

Small plot tests were conducted by C. A. Davis, Jr. and A. W. Dimock at Ithaca, New York. There were 8 plants per plot and 3 replicates of each treatment. Sprays were applied weekly with a power sprayer.

Excellent control was obtained with Puratized Agricultural Spray (1 pint/100 gal.) and very good control with Bioquin 1 (1 lb./100 gals.) and Dithane Z-78 (1 lb./100 gals.). Poor results were obtained with Zerlate, Fermate, Crag 341C, Crag 341SC, Tag 331, Orthocide 406, Phygon XL, Vancide 51, and Vancide 51 plus lime. There was no evidence of mercury injury on the Puratized and Tag plots.

NARCISSUS

Basal rot (*Fusarium*). W. D. McClellan reported tests at Beltsville, Maryland, in which King Alfred narcissus bulbs were treated three days after digging and again just before planting. Liquid materials were used as a 5-minute dip. Best disease control and yield were obtained with Tag HL 331 (10 lbs. soln./800 gal. water), Mersolite P dust (2% phenyl mercury acetate in bentonite), and Mersolite 8 (1 lb./800 gal.). Less satisfactory control and yield were obtained with Dow F-800 dust, Compound "A" (9.25% p.m. a.), Puratized Apple Spray, Arasan SF, Dynacide, and Dow 9B.

In tests at North Carolina, F. A. Haasis reported best control of basal rot and plant safety with Mersolite 8 (1 lb./700 gal.) as a 5-minute steep. Other materials considered less satisfactory, because of poorer disease control or plant injury, included Mersolite W,

Mersolite 15, Ceresan 5%, Ceresan M, Ceresan 2%, and Dow 9B plus Fermate.

AZALEA (*RHODODENDRON* SP.)

Petal blight (*Ovulinia azaleae*). D. L. Gill, at Spring Hill, Alabama, reported good control with sprays of Dithane D-14 + zinc sulfate + lime, Dithane D-14 + zinc sulfate, and Parzate. Dithane D-14 plus lime and Dithane D-14 plus spreader gave good control but were very injurious. Dithane Z-78 and manganese ethylene bis dithiocarbamate gave only fair control.

WESTERN SYCAMORE (*PLATANUS RACEMOSA*)

Anthrachnose (*Gnomonia veneta*). Pierre A. Miller and G. A. Zentmyer report significant control with the following sprays in decreasing order of effectiveness: Puratized Agricultural Spray (1 qt./100 gals.); Phygon XL plus Karathane W.P. 25 (both at 2 lbs./100 gals.); Phygon XL (2 lbs./100 gals.); Bordeaux mixture (6-6-100); Bioquin 1 (1.16 lbs./100 gals.); Goodrite Zac (2 lbs./100 gals.); and Dithane D-14 (2 qts./100 gals.). The amount of disease ranged from 10.14 to 23.13 percent in the sprayed plots to 32.92 percent in the untreated checks. Dormant plus foliage sprays were compared with foliage sprays alone, but there were no significant differences.

Spray tests for sycamore anthrachnose control were conducted by J. C. Carter at Urbana, Illinois. Disease incidence was too light for reliable comparisons but none of the following materials caused injury when a series of three sprays was applied: Arathane W.P. 25 (1 lb./100 gals.); Bioquin 1 (1 lb./100 gals.); Crag 341C (1 qt./100 gals.); Fermate (2 lbs./100 gals.); manganese ethylene bis dithiocarbamate (2 lbs./100 gals.); Orthocide 406 (2 lbs./100 gals.); Puratized Agricultural Spray (1 pint/100 gals.); Puratized Apple Spray (1/2 pint/100 gals.); and Tag 331 (1/2 pint/100 gals.).

MISCELLANEOUS FUNGICIDE TESTS 1950

TURF

DOLLAR SPOT

(Sclerotinia homeocarpa) control.

California: (Los Angeles; P. A. Miller. Seven bi-weekly spray treatments, July 13 to September 28.)

Preference, based on disease control and plant safety: Puraturf 177 (1.6 oz.), Cadminate (.5 oz.), Caloclor (2 oz.), Carbide and Carbon 1025 (3 oz.), C. & C. 531 (3 oz.), P. M. A. S. (0.1 pint), Spergon (3 oz.), Tersan (3 oz.).

All concentrations in ounces to 10 gals. spray per 1000 sq. ft. Spergon and Tersan not considered worth further trial.

Pennsylvania: (Philadelphia; R. M. Means and H. W. Thurston, Jr. Four sprays, June 3, June 28, July 26, and August 30.)

Ratings based on spots per 100 sq. ft.,

season average: Cadminate (1.6 oz.) -- 7; Crag 531 (3 oz.) -- 13; Crag 1025 (3 oz.) -- 15; Puraturf 177 (1.6 oz.) -- 24; GG (1/2 pint) -- 48; Actidione (crude, 32 c.c.) -- 109; 111-5 (2.5 oz.) -- 112; Caloclor -- 124; Actidione (pure, 0.8 gms.) -- 199; Orthocide 406 (5 oz.) -- 466; check -- 1254.

TOBACCO

BLUE MOLD CONTROL

Florida: (Quincy; R. R. Kincaid. Cigar wrapper tobacco, var. Rg. Dust treatments, 3 times a week, 16 applications.)

Overall preference on basis of disease control, safety, and yield: Z-78 (6.5% active), Fermate (15%), Parzate (6.5%), Phygon (1%). Phygon safe at 1%, might be used at higher concentration with better results.

